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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/531,203	12/29/2005	Weiming Duan	0064.0002US1	6991

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EXAMINER

AFSHAR, KAMRAN

ART UNIT	PAPER NUMBER
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2617

MAIL DATE	DELIVERY MODE
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09/04/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/531,203

Applicant(s)

DUAN ET AL.

Examiner

Kamran Afshar, 571-272-7796

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 September 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 13 is/are rejected.
- 7) ☒ Claim(s) 2-12 & 14, 16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 September 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 04/13/05 & 9/19/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Oath/Declaration

1. The oath or declaration is defective. A new oath or declaration in compliance with 37 CFR 1.67(a) identifying this application by application number and filing date is required. See MPEP §§ 602.01 and 602.02.

The oath or declaration is defective because: the oath or declaration, which was filed on 12/29/2005 is a very poor quality facsimile transmission and is unreadable. Appropriate correction is required.

Drawings

2. Figure 1 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niemenmaa (U.S. Pub. No.: 2003/0190919 A1) in view of Naghian (U.S. Pub. No.: 2003/0148774 A1).

With respect to claim 1, Niemenmaa discloses a method for positioning a mobile station (See Niemenmaa e.g. Title, determining mobile station position, Page 4, lines 4-7¶ [0030]), comprising: the mobile communication network, when receiving a positioning request from a mobile station (See Niemenmaa e.g. determining mobile station position, base station, repeaters, and the signals (or auxiliary positioning signals), Page 4, lines 4-7¶ [0030]), instructing repeaters (See e.g. position request is sent from 605 to 601 of Fig. 6) to send [auxiliary positioning] signals, and the mobile station measuring (See Niemenmaa e.g. mobile station measures, Page 2, Lines 7-12 of ¶ [0009]) the position estimation parameters according to the received [auxiliary positioning] signals sent from the repeaters (See Niemenmaa e.g. measurement data, Page 4, Lines 34-36 of ¶ [0031]). However Niemenmaa is silent auxiliary positioning signals and downlink signals sent from the base station, and then estimating the position of the mobile station according to the measurement results, and thereby implementing the positioning of the mobile station. In an analogous field of endeavor, Naghian discloses auxiliary positioning signals (See Naghian e.g. as defined: Primary Common Pilot Channel, Page 5, ¶ [0055], employing IPDL method or mechanism, Page 7, Lines 1-2 of ¶ [0087]) and downlink signals sent from the base station, and then estimating the position of the mobile station according to the measurement results, and thereby implementing the positioning of the mobile station (See Naghian e.g. measurement of signal in downlink, base station, mobile station, Page 5, Lines 1-7 of ¶ [0071]). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Naghian to Niemenmaa to provide a positioning method and / or system to make measurement of the radio signals both in the uplink and/or in the downlink, i.e. at the base station end or at the mobile station end or at both. In case the mobile station is used for the measurements of the signal, it may use e.g. the control channels of the radio network for sending the measurement results to an appropriate network element (i.e. base station or the mobile station, network controller, etc., Page 5, Lines 1-7 of ¶ [0071]).

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5. Claim 13, 17, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niemenmaa (U.S. Pub. No.: 2003/0190919 A1) in view of Endo (U.S. 5, 734,982 A) further in view of Sabat (U.S. Pub. No.: 2003/0157943 A1).

With respect to claim 13, Niemenmaa discloses a repeater (See Niemenmaa e.g. 601, 605, 400s of Fig. 6) for implementing the function of positioning (See Niemenmaa e.g. positioning request, steps 200-201, 205 of Fig. 2), the mobile station (See Niemenmaa e.g. determining mobile station position, base station, repeaters, and the signals (or auxiliary positioning signals), Page 4, lines 4-7¶ [0030]). However, Niemenmaa does not explicitly teach comprising a downlink processing channel and an uplink processing channel. In an analogous field of endeavor, Endo discloses a similar repeater system (See Endo e.g. Fig. 8). Further, Endo teaches a signal processing unit having uplink channel processing unit and a downlink channel processing unit (See Endo e.g. Co. 4, Lines 22-26). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Endo to Niemenmaa to provide a signal processing units having uplink channel processing units for performing signal processing for uplink radio channels, and downlink channel processing units for performing signal processing for downlink radio channels so that a radio communication system in which accessible channels in each frequency are informed, and channel assignment is performed in accordance with service requests as suggested (See Endo e.g. Co. Co. 4, Lines 22-26 & Co. 1, Lines 60-63). In an analogous field of endeavor, On the other hand, Sabat discloses channel includes an added auxiliary positioning unit (See Saba e.g. 103 of Fig. 6), which receives downlink signals from the base station (See Saba e.g. Pilot 1-3 of Fig. 4) and signals carrying auxiliary (See Saba e.g. Pilot 1&R of Fig. 4) positioning parameters (See Saba e.g. PN offset, frequency, color code, etc., Page 1, Lines 6-8 of ¶ [0008]) sent from the mobile communication network (See Sabat e.g. 2-6), generates and (See Sabat e.g. Pilot generator, 40 of Fig. 4, 54-1 to 54-4 of Fig. 5) of sends auxiliary positioning signals to the mobile station (See Sabat e.g. the auxiliary pilot signals are generated and added to the other data (or parameter), repeater, base station, etc., Page 1, ¶ [0010] & page 2, Lines 7-8 of ¶ [0025])).

Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Sabat to Endo and Niemenmaa to provide a system to measure time delay

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difference between base station and its repeaters as suggested (See Sabat e.g. Page 3, Lines 1-2 of ¶ [0035]).

Regarding claim 17, it is obvious that communication module (See Endo e.g. transmission / reception communication communicating circuit 61, of Fig. 6 & Co. 6, Lines 14-15) receives auxiliary (See Saba e.g. Pilot 1&R of Fig. 4) positioning parameters (See Saba e.g. PN offset, frequency, color code, etc., Page 1, Lines 6-8 of ¶ [0008]) from the base station through signaling (See Sabat e.g. signaling as shown in Figs. 2-6).

Regarding claim 20, it is obvious that input signals of the auxiliary positioning unit (See Saba e.g. 103 of Fig. 6 & Pilot 1 & R and 40 of Fig. 4) are obtained from a node (See Sabat e.g. 35a of Fig. 6) in the downlink processing channel of the repeater (See Endo e.g. Co. 4, Lines 22-26).

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niemenmaa, Endo, and Sabat and further in view Hasarchi (U.S. Patent 6,873,823 B2).

Regarding claim 15, Niemenmaa, Endo, and Sabat disclose everything as discussed above in the rejected claim 13. However, they are all silent that the downlink processing channel comprises a low noise amplifier, a filter, and a power amplifier. In an analogous field of endeavor, Hasarchi discloses the downlink processing channel comprises a low noise amplifier, a filter, and a power amplifier (See Hasarchi e.g. repeater 100, 115D, B down stream (or downlink), filter 140D, HPA 145D as shown in Fig. 5, Co. 5, Lines 39-58). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Hasarchi to Sabat, Endo and Niemenmaa to provide a bi-directional repeater including uplink section which receives signals from mobile device and retransmits the signal to base-station and downlink section which receives signals from base-station and retransmits the signals to the mobile device and as the signals are associated with a communication channel at a specific frequency as suggested (See Hasarchi e.g. Co. 3, Lines 62-67 and Co. 3, Lines 39-40).

7. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niemenmaa, Endo, and Sabat and further in view of Mountney (U.S. Pub. No.: 2002/0082050 A1).

Regarding claim 18, Niemenmaa, Endo, and Sabat disclose everything as discussed above in the rejected claim 13. However, they are all silent that communication module receives auxiliary positioning parameters via the operation and maintenance terminal of the repeater. In an analogous field of endeavor, Mountney discloses Operations, administration and maintenance of components in a mobility network (See Mountney e.g. Title). Further, Mountney discloses that in case of repeaters, the control channel or (communication channel) is used to perform QA&M (See Mountney e.g. Page 1, Lines 6-8 of ¶ [0008]). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Mountney to Sabat, Endo and Niemenmaa to provide a method or a system for implementing the OA&M on a system component so that detailed operating measurements and reports, as well as instructions (e.g., change parameters or settings) and controls, can be sent over the same administration link as suggested (See Mountney e.g. Page 2, Lines 1-2 of ¶ [0015] & Page 2, Lines 7-9 of ¶ [0021]).

8. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Niemenmaa, Endo, and Sabat and further in view of Weissman (U.S. Pub. No.: 2003/0045230 A1).

Regarding claim 19, Niemenmaa, Endo, and Sabat disclose everything as discussed above in the rejected claim 13. However, they are all silent that input signals of auxiliary positioning unit are directly obtained through coupling with the forwarding antenna. In an analogous field of endeavor, Weissman discloses a repeater with diversity transmission (See Weissman e.g. Title). Further, Weissman discloses the concept of the forward antenna which receives the forward transmission and components or elements that are coupled together (See Weissman e.g. Page 6, Lines 1-5 and Lines 12-13 of ¶ [0125]). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Weissman to Sabat, Endo and Niemenmaa to a repeater system comprises elements housed within a single unit, at least some of the elements repeating forward signals transmitted from a base-station transceiver system (BTS) to a mobile transceiver. Some of the elements conveying the forward transmission signals are also utilized within the single unit for repeating main

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reverse signals transmitted from the mobile to the BTS as suggested (See Weissman e.g. Page 1, Lines 2-8 of ¶ [0009]).

9. Claim 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Niemenmaa, Endo, and Sabat and further in view of Karabinis (U.S. Patent 5,937,332 A).

Regarding claim 21, Niemenmaa, Endo, and Sabat disclose everything as discussed above in the rejected claim 13. However, they are all silent that output signals of the auxiliary positioning unit are outputted after combining with signals from the repeater at a node (See Karabinis e.g. 418 of Fig. 4) in the downlink processing channel of the repeater. In an analogous field of endeavor, Karabinis discloses the concept of output signals are outputted after combining with signals from the repeater at a node in the downlink processing channel of the repeater (See Karabinis e.g. 400 of Fig. 4, Page8, lines 1-3 of [0101] and Lines 3-5 of [0102]). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to provide above teaching of Karabinis to Sabat, Endo and Niemenmaa to provide a combiner to add signal a repeater for use in wireless communication systems having an embedded wireless communication device capable of interacting with base stations communicating with and through the repeater to affect control of repeater gain and output power as suggested (See Karabinis e.g. Page1, Lines2-6 of ¶ [0003]).

Regarding claim 22, it is obvious that output signals of the auxiliary positioning unit (See Saba e.g. 103 of Fig. 6 & Pilot 1 & R and 40 of Fig. 4) are sent via a forwarding antenna after combining (See Karabinis e.g. 418 of Fig. 4) with signals from the repeater before the power of the downlink processing channel of the repeater is amplified (See Karabinis e.g. 400, 422, 406 of Fig. 4, Page8, lines 1-3 of [0101] and Lines 3-5 of [0102]).

Allowable Subject Matter

10. Claims 2-12, 14, 16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Regarding claim 2, the prior art of record fails to disclose singly or in combination or render obvious that further comprising: a. the mobile communication network, when receiving a

positioning request from the mobile station, instructing the serving base station to measure Round Trip Time (RTT) between the serving base station and the mobile station, receiving the measurement result reported from the serving base station, and at the same time sending a measurement control message to the mobile station; b. determining all repeaters that take the serving base station as a donating base station, configuring auxiliary positioning parameters for the repeaters, and controlling the transmission of auxiliary positioning signals of the repeaters to the mobile station; c. the mobile station measuring TDOAs between the base stations and the repeaters according to the measurement control message sent from the mobile communication network and the auxiliary positioning signals sent from the repeaters, and reporting the measurement results to the mobile communication network; d. the mobile communication network estimating the position of the mobile station according to the received RTT between the serving base station and the mobile station as well as TDOAs between the base stations and the repeaters, and thereby determining the position of the mobile station.

Regarding claim 14, the prior art of record fails to disclose singly or in combination or render obvious that auxiliary positioning unit comprises: a communication module, which receives signals carrying auxiliary positioning parameters sent from the mobile communication networks a frame timing recovery module, which receives downlink signals from the base station, processes the signals to obtain a frame synchronization signal, and sends said frame synchronization signal to a timing control module and a pilot modulating module, respectively; a timing control module, which receives the frame synchronization signal sent from the frame timing recovery module, generates and sends an pulse sequence to the pilot modulating module; a pilot modulating module, which receives the frame synchronization signal sent from the frame timing recovery module and the pulse sequence sent from the timing control module, generates and sends auxiliary positioning signals to the mobile station.

Regarding claim 16, the prior art of record fails to disclose singly or in combination or render obvious that the auxiliary positioning unit, depending on the actual structure of the repeater, also comprises: a RF processing module, which comprises an automatic gain control

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sub-module, a RF receiving and filtering sub-module, and a down frequency converter, and outputs RF signals to an intermediate frequency processing module; an intermediate frequency processing module, which comprises an intermediate frequency filtering sub-module, an analog-digit converting sub-module, and a digital down frequency converter, and receives RF signals sent from the RF processing module, processes the RF signals and generates base-band signals, and sends the base-band signals to the frame timing recovery module.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a) Dinkel (U.S. Pub. No.: 20903/0114103 A1).

b) Riley (U.S. 6,832,090 B2).

c) forrester (U.S. 7,181,171 B2).

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Kamran Afshar whose telephone number is (571) 272-7796. The examiner can be reached on Monday-Friday.

If attempts to reach the examiner by the telephone are unsuccessful, the examiner's supervisor, **Eng, George** can be reached @ (571) 272-3984. The fax number for the organization where this application or proceeding is assigned is **571-273-8300** for all communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Kamran Afshar